DOCUMENT RESUME

ED 310 808 JC 890 414

AUTHOR Cohen, Elaine; And Others
TITLE Approaches to Predicting Student Success: Findings and Recommendations from a Study of California Community Colleges.
SPONS AGENCY California Community Coll. Fund for Instructional Improvement.
PUB DATE 6 Oct 89
NOTE 28p.
PUB TYPE Reports - Research/Technical (143) -- Tests/Evaluation Instruments (160)

EDRS PRICE MF01/PC02 Plus Postage.
DESCRIPTORS Community Colleges; *Educational Needs; *Predictive Measurement; *Predictive Validity; *Predictor Variables; Program Evaluation; Questionnaires; Student Characteristics; *Student Placement; Tables (Data); Two Year Colleges

ABSTRACT

In the summer of 1987, a project was undertaken by a consortium of eight California community colleges to develop valid and culturally fair assessment procedures for placing students into appropriate level courses. The specific objective of the project was to provide a guide to the state's community colleges for the development of these procedures in a manner consistent with the statewide matriculation plan. Data for the project were obtained from completed surveys of 24,000 students and 1,600 faculty members at the 8 colleges regarding the skills considered most important for student success; a comparison of 1987-88 student scores on assessment tests to students' actual grades; and a retrospective study of the relationship between student characteristics and grades. Major findings included the following: (1) while reading and study skills were considered important by students and faculty in all disciplines, other skills varied from subject to subject and from college to college; (2) over 80% of students and faculty felt that students were appropriately placed into English or math classes; (3) new students who had tested at college level in reading, writing, and/or math were more likely to pass these classes than those testing one level below college level; (4) in general, 30% of the students predicted to pass courses on the basis of background characteristics failed to do so, representing the greatest error in the project's attempt to predict grades; (5) the eight variables found to be the best predictors of student grades were high school graduation status, number of hours employed, units planned, age, high school grade point average, math placement test score, reading placement test score, and English placement test score; and (6) in some colleges, course grades were predicted more accurately for White and Asian students than for Hispanic and Black students. Recommendations are provided for improving institutional practices in the areas of assessment, orientation and advisement, instruction, and research. The student and faculty survey instruments are appended. (JMC)

ED310808

Approaches to Predicting Student Success

Findings & Recommendations From a Study of California Community Colleges

Dr. Elaine Cohen
Project Co-Director

Dr. Jack Friedlander
Project Co-Director

Dr. Eve Kelemen-Lohnas
Project Consultant

Mr. Robert Elmore
System Analyst for Project

October 6, 1989

Funded by a Grant from The Chancellor's Office of the California Community Colleges' Fund for Instructional Improvement

"PERMISSION TO REPRODUCE THIS MATERIAL HAS BEEN GRANTED BY

J. Friedlander

TO THE EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC)."

U.S. DEPARTMENT OF EDUCATION
Office of Educational Research and Improvement
EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC)

/ This document has been reproduced as received from the person or organization originating it.

☐ Minor changes have been made to improve reproduction quality.

• Points of view or opinions stated in this document do not necessarily represent official OERI position or policy.

JC890414

BEST COPY AVAILABLE

Introduction

In the summer of 1987 the Chancellor's Office awarded a Fund for Instructional Improvement Grant to Santa Barbara City College to develop valid and culturally fair assessment procedures for placing students into appropriate level courses.

The project was conducted by a consortium of the following community colleges: Allan Hancock College, College of the Sequoias, Compton College, Long Beach City College, Mesa College, Miramar College, Santa Barbara City College and San Diego City College. The colleges participating in the project were selected on the basis of common data collection procedures, ethnic diversity of students, geographic location (rural, urban, and suburban) and size.

OBJECTIVES OF THE PROJECT

The primary objective of the project was to provide a guide for all colleges for establishing well-conceived assessment procedures and fair and meaningful course requisites that are consistent with the Board of Governors' Matriculation Plan. Specific objectives were as follows:

1. Establish requisites for entry-level, degree-applicable courses which are based on assessment outcomes and which include considerations of how to assure that the setting of the requisites does not violate students' civil rights or have other illegal discriminatory impacts;

2. Identify the combination of criteria that prove to be the best predictors of student success;

3. Evaluate the reliability and validity of the criteria that faculty thought should serve as requisites of English, ESL, mathematics and entry-level, degree-applicable courses;

4. Develop a classification system for placing all entry-level, degree-applicable courses into categories that correspond to type and level of skill required for students to pass these courses;

5. Determine the validity of the criteria used for predicting grades in courses for different groups of students;

6. Develop a means for communicating to faculty, counselors and students the probability of students' succeeding in particular courses based on assessment scores and educational background characteristics.

Specific questions to be answered were:

a. Which skills do faculty and students perceive as important for success in particular courses?

b. Are the assessment tests used to place students in courses good predictors of students' success in those courses?

c. Is it better to use multiple variables for placing students in courses? If so, how do we determine what variables are the best predictors of students' success in particular categories of courses?

d. Are the assessment tests and course placement procedures biased against students from different ethnic and linguistic groups?

e. To what extent are the recommended skills levels for a course related to students' chances of successfully completing the course?

f. What are the success rates of students who enroll in courses contrary to the advice provided by the college?

PROCEDURES

The procedures used to address the questions noted above are described in this section of the report. A detailed description of the procedures followed in this study is provided in the technical report entitled, "Preparing Data Needed for Predicting Students' Success in College Courses" *(Lohnas & Elmore, 1989).*

1. Which skills do faculty and students perceive as important for success in particular classes?

A task force from the project colleges developed student and faculty surveys that included specific skills thought to be important for students to complete courses successfully. These skills included reading, writing, math, listening, speaking, critical thinking and study skills. The surveys were administered to students and faculty members in a sample of pre- collegiate and entry-level, degree-applicable courses at each of the colleges during the eighth week of the 1987 fall semester *(Attachment A & B).*

The student surveys asked respondents to rate the degree of importance of each of 14 skills to earning a grade of "C" or better in the course in which the survey was administered. They were also asked to rate their competence in each of the skill areas. Additionally, students in English and math classes were asked to indicate whether or not they thought they were appropriately placed in that course.
The faculty were given a parallel survey which they completed at the same time as the students. This survey differed from the one given to the students in that the faculty were asked to indicate how important each of the skills were for succeeding in their course and how competent their students were in each of the skill areas. English and math faculty were also asked to indicate the percentage of students who they thought were appropriately placed in their courses.

Completed surveys were received from approximately 24,000 students and 1,600 faculty representing the eight participating colleges.

The data from the surveys was used to compare faculty and student perceptions of the skills necessary for success in particular courses. Students' perceptions of their skills were compared with actual placement levels based on assessment test results. In English and math classes, students' and instructors' perceptions of the appropriateness of students' placement were compared.

2. Are the assessment tests used to place students in courses good predictors of students' success in those courses?

What are the success rates of students who enrolled in courses contrary to the advice provided by the colleges?

To what extent are the recommended skills levels for a course related to students' chances of successfully completing the course?

Student placement levels in reading, writing and math were compared with actual grades students received in a variety of courses across the curriculum. These cross-tabulation analyses were based on data collected during the 1987-88 academic year. The relationship between students' scores on the assessment tests and their grades in particular courses was examined. The pass rates of students who would have been advised to enroll in a particular course and the pass rates of those who would not have been advised to enroll in that same course were also determined.

The cross-tabulation analyses were also used to compare the grades of students in various ethnic groups who had comparable scores on the assessment tests. This was one of the approaches taken to determine if bias existed in college practices for students in particular ethnic groups.

3. Is it better to use multiple variables for placing students in courses? If so, how do we determine which variables are the best predictors of students' success in particular categories of courses?

A retrospective study was conducted to examine the relationship between multiple variables and student grades in classes. The study, which was based on data collected from the 1987- 88 academic year, involved using several variables to predict student grades. The predictor variables, which are listed below, were obtained from assessment tests, student responses to the colleges' applications for admissions, and questionnaires. Additional information describing these variables is available in the technical report for this study *(Lohnas & Elmore, 1989).*

LIST OF VARIABLES USED TO PREDICT STUDENTS' GRADES

1. Measures of students' language skills and computational skills.

2. Student background characteristics (ethnic background, age; sex; veteran).

3. Length of time out of school.

4. Whether or not the student has a verified learning disability.

5. Educational background information, including:

   a. Highest level of educational attainment.
   b. Years of English completed in high school.
   c. Grade received in last English class completed.
   d. High School grade point average.
   e. Highest level of math class completed.
   f. Grade received in last math class completed.
   g. Length of time since student completed his/her last math class.

6. College Plans, including:

   a. Number of units the student plans to take the following term.
   b. Number of hours the student plans to be employed in a job while attending college.
   c. Most important educational goal.
   d. Major field of study.
   e. How definite the student is about his/her choice of major field.
   f. How important is it to people closest to the student that he or she attend college?
   g. How important is college to the student?

4. What is the appropriate statistical technique for predicting students' grades in courses?

The original design for the project called for using student test scores and background characteristics to predict student grades in their courses. The appropriate statistical technique for this type of design is multiple regression. As the project unfolded, we realized that the accuracy of our findings would be underminded if we tried to predict if a student received an "A," "B," "C," "D," "F," or "W" in a particular course. This is because the difference between an "A" and "B" or a "B" and "C" is often subtle and varies a great deal from instructor to instructor teaching the same course. Therefore, it was decided to identify variables that best predicted whether or not a student would receive a grade of "C" or better in a particular course. Since the dependent variable became a categorical ("C" or better versus "D," "F," "W," or "NC") rather than a continuous variable ("A - F"), the appropriate statistical analysis was no longer multiple regression but rather logistic regression. Additional information describing the logistic regression statistical procedure used in this study is provided in the technical report for this study *(Lohnas and Elmore, 1989).*

5. How Should Grades Of "D" And "W" Be Treated?

The next problem we encountered had to do with "W" (withdrawal) grades. Should "Ws" be treated as course failures or should they be dropped from the analyses? Results of the logistic regression analyses showed that the accuracy of predicting whether or not a student would earn a great of "C" or better was substantially greater when "W" grades were excluded from the "D," "F," "NC" category. This is because students may withdraw from a course for variety of reasons, some of which may have no connection with their ability to complete the coursework.

The question of whether to place "Ds" in the successful course completion category or in the non-successful course completion category was explored. The findings of the analyses showed that the accuracy in predicting students' success in their courses was higher when "Ds" were placed in the category containing "Fs" and "NCs" than in the "A," "B," "C" category.

FINDINGS

1. Which skills do students and faculty perceive as important for success in particular classes?

Finding: With the exception of reading and study skills, the skills perceived to be important for success varied from subject to subject and college to college. A skill was considered as being important if 70% or more of the students and faculty rated it on the survey as "important" or "very important" to succeed in a particular class.

Business Cluster: Students and faculty agreed that the following skills were important for succeeding in their business courses: reading, speaking and listening, drawing reasonable conclusions and study skills. Faculty differed from students in that they rated grammar and critical thinking skills as important.

Social Science Cluster: Both faculty and students across colleges agreed that reading, understanding lectures, reasoning and study skills were important in succeeding in social science classes. There was a great deal of variation among colleges on the importance assigned to writing, speaking and listening skills. With the implementation of Title V Standards for the Associate Degree, this finding should change.

Psychology: Students and faculty agreed that the following skills were necessary for success: reading, speaking and listening, reasoning and study skills. Faculty members differed from their students in the high degree of importance they assigned to writing and interpreting charts and graphs.

Music Appreciation: There was a consensus among students and faculty on the importance of reading, study skills and identifying main points in a lecture or discussion. Faculty, but not their students, thought the following skills were needed to succeed in their classes: presenting ideas in writing, using correct grammar, and reasoning.

Accounting: There was concurrence among students and faculty on the importance of reading, ability to answer and ask questions in class, ability to identify and understand main points in lectures and discussions, mathematics and problem solving skills, the ability to draw conclusions, and study skills.

Introductory Spanish: The skills identified by both faculty and students as being important for succeeding in Spanish classes were reading, speaking and listening and study skills. In addition, faculty thought that the ability to draw reasonable conclusions was important.

Chemistry: Students and faculty in introductory chemistry courses agreed on the importance of the following skills for succeeding in their classes: reading, answering and asking questions in class, understanding main points in a lecture, mathematics and problem solving skills, interpreting graphs and charts, and study skills.

U.S. History: The following skills were identified by both faculty and students as being important to succeed in U.S. history: reading, writing and grammar, identifying main points in discussion, ability to draw conclusions and study skills. In addition, faculty members, but not their students, assigned a high degree of importance to writing term papers, speaking and listening skills, ability to distinguish between fact and fiction and the ability to interpret graphs and charts.

Recommendation 1:

In addition to assessing students' reading, writing and math skills, colleges should include measure of students' reasoning, speaking, listening and study skills in their procedures for establishing recommendations for course placements. Ideally, such information would be obtained from valid assessment instruments designed to measure students' competencies in these areas. However, this is impractical given the length of time and resources required to administer such tests. Therefore, it is recommended that colleges gather this information from self report inventories.

The skills students and faculty identified as being necessary to succeed in a course varied from subject to subject. For example, math skills were regarded as important for succeeding in chemistry and physics classes but not for biology and earth science classes. Therefore, colleges should develop separate prediction equations for different clusters of classes.

2. To what extent do students feel they are appropriately placed in English and math classes?

To what extent do English and math faculty feel that students were appropriately placed into their classes?

Finding:

When asked during the eighth week of the semester whether or not students were appropriately placed into their English or math classes, over 80% of students and faculty answered in the affirmative. The high degree of satisfaction with course placements held for all ethnic groups.

Of those students who were not satisfied with their course placements, most thought they should be at a higher level. This is particularly true among Asian students enrolled in pre-college level math classes.

While faculty thought most of their students were placed appropriately, some noted that 20-30% of their students should have been placed at a lower level.

TABLE 1

BEGINNING ALGEBRA
Student Satisfaction with Placement
(N=612)

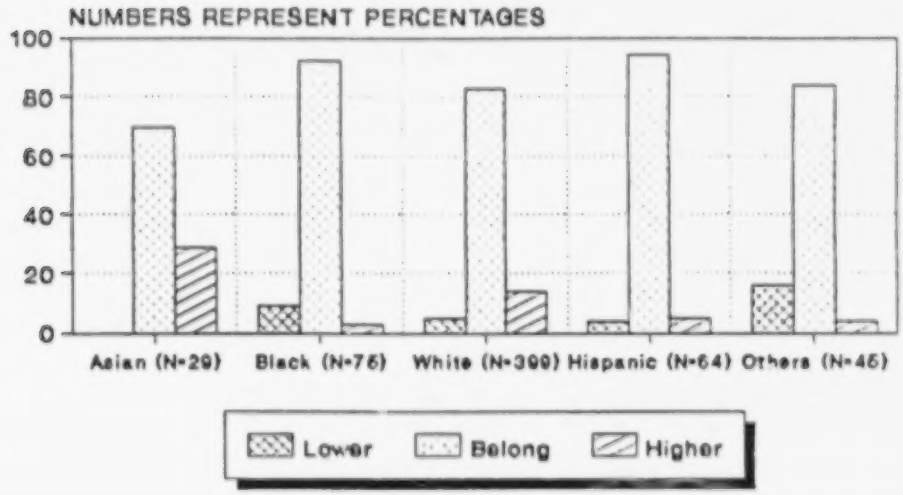
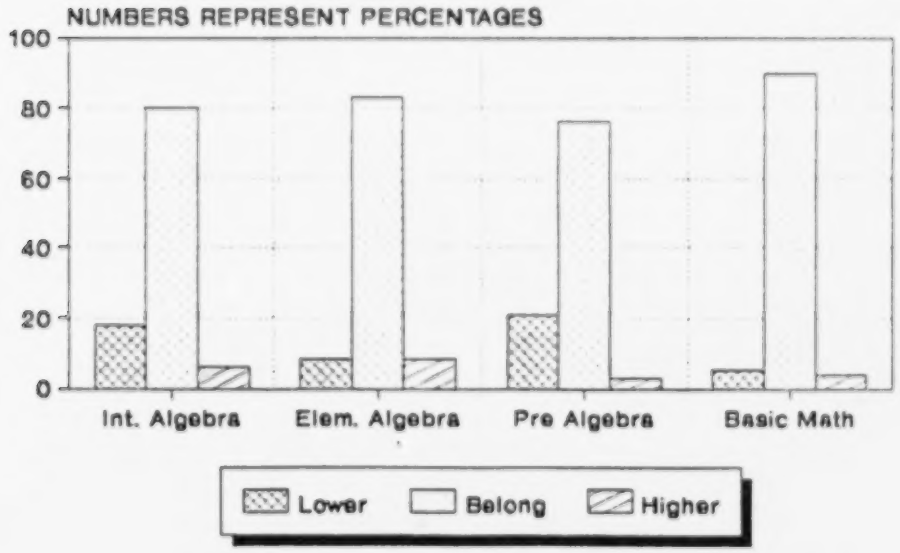


TABLE 2

MATH FACULTY OPINION OF
Student Placement



There was some variation within each of the colleges in the percentage of students faculty thought should have been placed at a lower level than the courses in which they were enrolled.

For some courses faculty felt that less than 10% of the students were appropriately placed; whereas faculty in other courses at the same institution felt that 20-30% of their students were inappropriately placed.

Recommendation 2:

Colleges should examine the relationship between the assessment test and course content in those classes where faculty felt that more than 15% of their students were inappropriately placed.

There are a number of reasons that may have accounted for the finding that in some classes faculty felt over 15% of their students were inappropriately placed. These factors include: 1) the need to raise cut-off scores; 2) lack of congruency between the English or math skills measured by the assessment test and the English or math skills needed to succeed in particular courses; and/or 3) the possibility that the factors used in recommending course placements did not include other essential skills needed to succeed in those classes (e.g., time management or reasoning skills).

If Asian students are not satisfied with their placement in math classes, colleges should examine the extent to which language skills affect students' performance on the math assessment test. Deficiencies in language skills may result in a lower level placement in math than is warranted by the students' math skills. If there is a strong relationship between language skills and performance on the math placement test, colleges should encourage students to enroll in English classes in conjunction with their math class.

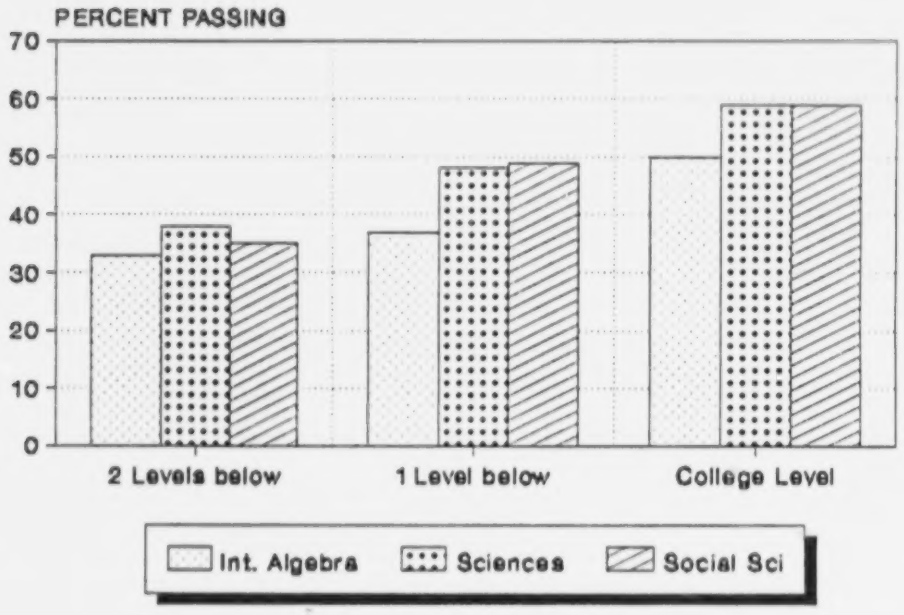
3. Are scores on English and math assessment tests related to students' grades in courses?

Finding:

Yes, new students who had college level skills in reading, writing and/or math were more likely to pass their class than those in the same class whose skills were one level below college level. Similarly, students whose skills were one level below college level were more likely to receive a passing grade than those few students whose skills were two or more levels below college level. This finding held for students in different ethnic groups.

TABLE 3

Percent Of New Students At Eight Colleges With Assessment Scores One Or Two Levels Below College Level Who Passed The Course, Compared With Those With College Level Skills.



Recommendation 3:

Results based on valid and reliable assessment tests should be used in conjunction with other variables in determining recommended course placements.

4. Do students follow the advice provided by colleges regarding the courses in which they should enroll?

Finding:

Yes, the overwhelming majority of students enrolled in courses that were recommended on the basis of their scores on the reading, writing and math assessment tests. For instance, of the 3,958 students enrolled in social science classes, only 8% had scores that were 2 or more levels below college level English.

Recommendation 4:

Since students are following advice regarding course placements and since our ability to predict student grades is not perfect, course placement schemes should remain advisory. Colleges should inform students with skills deficiencies of the low probability of passing a course that is two or more levels above their placement level. Furthermore, they should strongly encourage these students to seek needed remediation.

5. What percentage of the students predicted to pass a course did not do so (false positives)?

Finding:

The greatest error in predicting grades in courses occurred because students predicted to pass a course with a grade of "C" or higher actually received a grade of "D", "F", "NC", or "W". This error in prediction is called a "false positive". Based on the assessment and educational background characteristics collected, there was every reason to believe these students would successfully complete their course. Table 4 shows the range in the percentage of false positives for a sample of courses across the eight project colleges. To illustrate, the percentage of false positives in beginning algebra ranged from a low or 21% at one college to a high of 44% at another. In most instances, over 30% of the students predicted to pass a particular course did not do so.

TABLE 4

Range of False Positives Among Colleges

	Low	High
Beginning Algebra	21%	44%
Intermediate Algebra	23%	43%
Science Classes	14%	43%
College English	19%	37%
English One Level Below	21%	42%
Business	14%	52%
Social Sciences	19%	45%

Recommendation 5:

Many factors may have accounted for the high rate of false positives. Among these factors are inappropriate cut-off scores, exclusion of important variables from the prediction equations that may have been highly correlated with students' grades, and/or the need for some adjustments in advising and instructional practices. Colleges should consider taking the following actions to increase students' changes of succeeding in their courses.

1. Re-examine cut-off scores on assessment tests used for recommending course placements.

2. Collect data on other variables not considered in this study, such as learning skills, for use in predicting grades. The learning skills assessed should be directly related to those needed to succeed in courses and should go beyond basic reading, writing and math skills.

3. Consider such factors as the interaction of the number of hours employed and number of units enrolled when advising students regarding course selection.

4. Examine instructional practices that may contribute to or detract from student success.

5. Examine institutional practices designed to facilitate student retention. Such practices may include the availability of support services, encouragement of student involvement in course-related activities, and promotion of frequent student interactions with faculty and staff.

Even if all of these recommendations are followed, there will always be a certain percentage of students capable of passing a class who will withdraw for reasons beyond the college's control.

6. What percentage of the students predicted not to succeed in a course were able to pass the course (false negatives)?

Finding:

Using colleges' present systems for placing students in classes, less than 10% of the students who were two or more levels below college level on the basis of the English or math assessment actually enrolled in college level classes. Of these few students, about one-third received a grade of "C" or higher.

If the colleges had used multiple criteria for advising students, less than 10% of the students who would have been advised not to enroll in a college level course would have passed. These are called "false negatives."Thus the use of multiple criteria resulted in a substantial reduction in false negatives over using assessment scores alone.

Recommendation 6:

Colleges should use multiple criteria rather than assessment test scores alone in recommending course placements.

TABLE 5

Percentage Of Students Predicted To Do Poorly In A Class Who Would Have Passed That Class If Multiple Criteria Had Been Used For Recommending Course Placements.

	College						
Courses	A	B	C	D	E	F	G
Business	0%	0%	1%	8%	0%	2%	
Algebra Beg.	10%	3%	9%	13%	3%	8%	4%
Algebra Int.	9%	2%		12%	9%	8%	7%
English	4%	1%	11%	1%	1%	2%	5%
Social Science	0%	1%	6%	2%	4%	0%	1%
Sciences	3%	19%	14%	0%	0%	1%	

7. Is the accuracy of predicting students' grades in courses increased by using multiple variables instead of test scores alone?

Finding:

Yes, for many courses, particularly in math and the sciences, the use of multiple criteria increased the accuracy of predicting students' grades compared to the colleges' existing placement schemes. For those courses in which multiple criteria did not increase the accuracy of predicting students' grades, the percentage of false negatives was decreased from about one-third to less than 10%.

TABLE 6

Improving The Accuracy Of Predicting Grades In Science Class.

College	Accuracy By Using Multiple Criteria	Percent Pass Course	Gain Using Multiple Criteria
A	65%	58%	+7%
B	67%	52%	+15%
C	67%	67%	0
D	68%	48%	+20%

Recommendation 7:

Colleges should analyze their data using logistic regression to determine if the use of multiple criteria contributes to the ability to predict students' grades over their existing placement practices. If so, the variables associated with student success should be used in the determination of recommended course placements.

However, if colleges find that the use of multiple criteria does not add to the accuracy of predicting student success for some courses, it may be that those variables are already taken into account in their existing advising practices.

This does not mean that colleges should be complacent. Given the rather modest pass rates of first semester students, colleges should examine other factors that may influence grades, such as study skills and motivation. If these factors do prove to be related to student success, then they should be incorporated into the college's course placement procedures.

8. Does the use of multiple criteria improve the accuracy of predicting students grades in math classes over the use of math tests scores alone?

Finding:

For beginning and intermediate algebra, the use of multiple criteria enabled colleges to increase the accuracy of predicting students' grades over the use of the math test scores alone. In addition to scores on the math tests, factors which added to the ability to predict student success in beginning and intermediate algebra classes included high school grade point average, units planned, hours employed and age.

TABLE 7

Increase In Accuracy Of Predicting Grades In Algebra Classes By Using Multiple Criteria Vs. Math Test Scores Alone.

ELEMENTARY ALGEBRA

College	Accuracy By Using Multiple Criteria	Percent Passing Course	Gain Using Multiple Criteria
A	52%	48%	+4%
B	61%	45%	+16%
C	55%	52%	+3%
D	58%	41%	+17%
E	64%	53%	+11%

INTERMEDIATE ALGEBRA

A	68%	52%	+16%
B	56%	55%	+ 1%
C	63%	49%	+14%
D	65%	47%	+18%

Recommendation 8:

Colleges should use multiple criteria in developing course placement systems for advising students into beginning and intermediate algebra.

9. What are the best predictors of student success?

Finding:

The variables used to predict student grades varied from district to district and from college to college. However, of the 60 variables examined, the eight variables listed below in Table 8 were found to be the most common best predictors of students' grades.

TABLE 8

8 Best Predictors Of Student Grades

English Test Score
Reading Test Score
Math Test Score (or math level)
High School GPA (self-reported)
Age
Units Planned
No. of Hours Employed
High School Graduation Status

Recommendation 9:

Colleges need to identify their own set of predictor variables based on information they collect from students. There is no one universal set of factors that predict success for all students in all courses at all colleges. However, the variables noted above should be considered when colleges examine their own data.

10. Are there differences in the accuracy of predicting course grades for students in different ethnic groups?

Finding:

Within certain colleges the accuracy of predicting students' grades varies by ethnic group. In most instances, where there were significant differences, the ability to predict course grades accurately for white and Asian students was better than for Hispanic and black students. It is important to note that discrepancies in the ability to predict grades of students within a particular college did not hold for all disciplines. In fact, the accuracy in predicting grades was not universally higher or lower for any particular ethnic group at any college.

TABLE 9

COMPARISON OF ACCURACY OF PREDICTIONS OF COURSE GRADES BY ETHNIC GROUP (BASED ON A SAMPLE OF COLLEGES).

	College English	Beginning Algebra
College A		
White	72%	58%
Hispanic	57%	47%
Others	66%	61%
College B		
White	69%	65%
Hispanic	49%	57%
Black	53%	62%
Asian	82%	79%
Others	64%	55%
College C		
White	60%	52%
Hispanic	59%	52%
Blacks	55%	
Others	55%	

Recommendation 10:

Since the ability to predict grades accurately for particular ethnic groups may vary from course to course, colleges need to identify other factors that may account for these differences. The fact that in some cases there were differences in the accuracy of predicting grades for different ethnic groups does not necessarily imply that the assessment tests or advising are biased. This is particularly true since the accuracy of predicting grades was not consistently better or worse for any ethnic group in any given college. Institutional and instructional practices may account for these differences.

11. Are there differences among colleges in the accuracy of predicting students' grades in courses?

Finding:

Yes, the ability to predict students' grades accurately varied among colleges. Differences in accuracy in predicting students' pass rates among colleges ranged from a low of 12% (56%-68%) for intermediate algebra classes to a high of 23% (42%-72%) for college-level English classes.

TABLE 10
ACCURACY IN ABILITY TO PREDICT STUDENTS' GRADES

	Lowest	Highest
Int. Algebra	56%	68%
Science	57%	76%
College Eng.	51%	73%
Eng 1 Below	49%	72%
Business	48%	66%
Soc. Science	55%	67%
Beg. Algebra	52%	67%

Recommendation 11:

Each college should develop its own set of criteria for predicting students' success in classes. There was not one set of factors that worked equally well in individual classes for all colleges.

12. Are there differences among ethnic groups in students' successful completion of classes?

In some colleges there were significant differences between ethnic groups in the percent of students entering with the same skills levels who successfully completed their classes. For the most part, however, among students who were appropriately placed, no one ethnic group did consistently better or worse than other groups within disciplines and across colleges. The procedures used in this study will enable colleges to evaluate their own results.

Recommendation 12:

In addition to assessment data, colleges should examine factors such as institutional and instructional practices that may have influenced students' success in classes.

IMPLICATIONS FOR IMPROVING INSTITUTIONAL PRACTICES

ASSESSMENT

1. Use Multiple Criteria For Course Placement

The use of multiple criteria versus test scores alone would, for many courses, increase the accuracy of predicting whether or not students would pass their classes. In addition, the use of multiple criteria rather than test scores alone would have reduced the number of students who would have been denied access into courses in which they could have succeeded.

2. Include Assessment Of Study Skills

Study skills were seen by both faculty and students as being very important for students to succeed in their classes. Furthermore, faculty members in most classes surveyed reported that over 70% of their students lacked study skills needed to succeed in their class. This finding strongly suggests that colleges should include measures of study skills in their decisions regarding course placements.

3. Explain Clearly The Importance Of Assessment Information For Advising

The information (test scores, educational background characteristics) used to place students in classes proved to be good predictors of students' success. Students should be informed of the relationship between the information collected during the assessment process and their probability of succeeding in particular categories of classes.

4. Provide Assessment And Advisement For All New Matriculating Students, Including Those Who Enroll During Late Registration.

Results of the matriculation evaluation study revealed that new matriculated students who were not assessed or advised had less than a 50% chance of returning to college for a second semester. First-to-second semester persistence rates of those new matriculated students were substantially less than the rates for first-time matriculated students who were assessed, including those who had deficiencies in both English and math. A large percentage of the new matriculating students who were not assessed or advised enrolled at the college during the first two weeks of classes (the late registration period). Therefore, colleges should make provisions for assessing and advising students regardless of when they enroll.

5. Re-examine Cutoff Scores And Placement Criteria To Minimize Errors In Predicting Students Success.

A high percentage of students who were predicted to succeed in their classes did not do so (false positives). The false positives reduced the accuracy of predicting students' grades.

6. Identify The Specific Skills That Best Predict Success In Particular Categories Of Classes (e.g., Writing, Reading, Study Skills, Math).

This should be done through surveying faculty to identify the basic skills needed for success in their courses and through statistical analyses to validate the relationship between students' skills and grades in particular categories of classes. The goal is to link assessment with instruction.

ORIENTATION AND ADVISEMENT

1. Provide Orientation And Advisement For All Matriculating Students Including Late Registrants.

Many students try to circumvent the matriculation program by enrolling in college during the first two weeks of the term. While these students may have been successful at avoiding taking part in orientation, assessment, and advising programs, they were not successful in completing their courses or persisting in college. The high failure rate of these students is due in part to their not being appropriately placed. Another factor related to their lack of success may be that during the first two weeks of the semester many classes are already closed. These students then may enroll in courses which may not be appropriate for them.

2. Provide Services For Part-time And Evening Students.

Course completion and college persistence rates of part-time and evening matriculated students were substantially lower than those of full-time and day matriculated students.

3. Advise Students Based On Profiles Of Successful Students.

During orientation or advisement sessions students should be provided with graphic illustrations on the probability of their succeeding in particular categories of entry-level courses. The profiles should be based on the multiple criteria that prove to be the best predictors of student success.

4. Strongly Recommend Rather Than Mandate Course Placements.

The criteria related to student success should provide the basis for strongly recommending as opposed to mandating appropriate course placements. This recommendation is based on the finding that the ability to predict students' success is less than perfect.

5. Explain To Students The Success Rates Of Students Who Do Not Follow Advice.

The orientation and advising sessions should include information on the low probability of students passing courses for which they are not prepared.

6. Provide Students With Specific Suggestions On Steps For Succeeding In College.

The orientation and advising sessions should include a component on actions students should take to increase their chances for success in college.

INSTRUCTION

1. Identify And Implement Teaching Strategies To Assist Students To Succeed In Their Courses.

A high percentage of students predicted to pass a course on the basis of assessment scores and educational background characteristics did not pass those courses. The factors used to predict student success were related to students' skills and characteristics prior to enrollment and did not take into account their interactions with students and instructors in the classroom. Therefore, colleges should examine instructional practices that may contribute to or detract from student success. The following are suggestions of steps that colleges should consider for increasing students' chances of succeeding in their classes.

a. Adjust curriculum where necessary to address students' learning needs. This may be achieved through such means as pairing study skills and reading classes with entry-level courses, incorporating study skills instruction into entry-level classes, offering modular skills classes, or adding preparatory courses for subject areas where students experience difficulty (e.g., economics, accounting).

b. Provide alternative approaches to delivering instruction such as collaborative learning or the use of instructional technologies.

c. Encourage faculty experimentation on the effectiveness of various instructional methods for achieving desired student learning outcomes.

d. Provide staff development opportunities for faculty to learn new approaches and technologies for delivering instruction and for assessing students' learning.

e. Develop strategies for encouraging students to take advantage of the resources provided at the college, e.g., interactions with faculty, use of support services, involvement in student activities.

RESEARCH

1. Establish Recommended Placement Levels And Course Requisites Based On Statistically Valid Criteria.

Researchers need to conduct logistical regression analyses to identify the factors that best predict student success in different categories of courses.

2. Examine Cut-off Scores On The Assessment Tests To Minimize Error In Predicting Students' Success In Courses.

Researchers should identify the cut off scores used for recommending course placements that minimize the number of false negatives and false positives.

3. Examine The Relationship Between The Multiple Criteria Used To Predict Student Success And Students' Grades On A Midterm Exam.

This procedure would provide colleges with a closer approximation of students' ability to succeed in a class. Many factors in addition to students' skills and educational characteristics measured during the assessment process affect students' decisions to withdraw from a class during a term. The purpose of assessment is to advise students into courses in which they can succeed. Looking at the relationship between factors collected during assessment and the midterm grade rather than end of term grade reduces the influence of factors other than students' skills (e.g., illness, changes in employment, family, personal problems) that may affect students' decisions to withdraw from a class.

4. Identify Factors Related To Students' Decisions To Withdraw From Classes.

Variables that were good predictors of whether or not students would pass a course did not prove to be good predictors of whether a student would withdraw. Researchers need to see if there are factors not currently measured that are associated with withdrawal from courses.

5. Identify Categories Of Courses In Which Similar Skills Are Needed For Students To Succeed.

It would be unwieldy to advise students using different criteria for each course in the curriculum. Researchers need to identify the criteria that best predict student success for each course and then combine those courses with similar criteria into categories (e.g., social sciences, physical sciences, biological sciences).

6. Identify Course And Instructional Related Factors Necessary For Success In Particular Categories Of Courses.

Researchers should conduct a survey of students and faculty to identify the skills and motivational factors students need to succeed in their classes. Consideration should be given to measuring these factors during the assessment process.

7. Develop Effective Procedures For Disseminating Results On Factors Related To Student Success To College Support Staff, Faculty And Students.

Researchers need to identify how the information will be used by various groups in order to design their reporting methods so each of the various groups can use the research findings in the most effective and efficient manner possible.

Printed in U.S.A. NCS Trans-Optic® MP08-75091-321 A2403

SURVEY OF STUDENTS' PERCEPTIONS OF SKILLS NEEDED TO SUCCEED IN THEIR CLASSES

CORRECT MARK

Dear Student:

The purpose of this study is to learn more about the skills you think are needed to succeed in this class. Please complete this survey and return it to your instructor. Your answers to this survey will be used for research purposes only and will not become part of your permanent record.

COURSE ID (Ask your instructor for this number)	YOUR SOCIAL SECURITY NUMBER
	– –

YOUR NAME _____

How important are each of the following skills in succeeding in this class?

a = not applicable b = not important c = somewhat important d = important e = very important

READING SKILLS

1. The ability to understand the textbook, manual or other assigned readings ..... a b c d e
2. The ability to summarize the main points in a reading assignment ..... a b c d e

WRITING SKILLS

3. The ability to take ideas and present them in a written assignment or report ..... a b c d e
4. The ability to write a term paper ..... a b c d e
5. The ability to write Standard English sentences with correct sentence structure, verb forms, punctuation, capitalization, possessives, plural forms, word choices and spelling ..... a b c d e

SPEAKING AND LISTENING SKILLS

6. The ability to communicate ideas clearly in class ..... a b c d e
7. The ability to answer and ask questions in class ..... a b c d e
8. The ability to identify and understand the main points and supporting ideas in lectures and discussions ..... a b c d e

MATHEMATICS SKILLS

9. The ability to solve problems using addition, subtraction, multiplication and division ..... a b c d e
10. The ability to select and use appropriate mathematical approaches in solving problems ..... a b c d e

REASONING SKILLS

11. The ability to draw reasonable conclusions from information that you read or heard ..... a b c d e
12. The ability to distinguish between fact and opinion ..... a b c d e
13. The ability to interpret graphs and charts ..... a b c d e

STUDY SKILLS

14. The ability to take useful notes ..... a b c d e

THE ABILITY TO PREPARE FOR AND COMPLETE THE FOLLOWING TYPES OF EXAMS:

15. In-class essay exams ..... a b c d e
16. Short answer exams ..... a b c d e
17. Objective exams (true/false, multiple choice, matching) ..... a b c d e
18. Take home essay exams ..... a b c d e
19. In-class performance or demonstrations ..... a b c d e

For each of the six skill areas listed below, please indicate the extent to which you agree with the following statement.

In my opinion, I entered this class with the skills needed to achieve a grade of "C" or higher.

a = strongly agree b = agree c = somewhat agree d = do not agree e = not applicable

20. Reading ..... ⓐ ⓑ ⓒ ⓓ ⓔ
21. Writing ..... ⓐ ⓑ ⓒ ⓓ ⓔ
22. Speaking and Listening ..... ⓐ ⓑ ⓒ ⓓ ⓔ
23. Mathematics ..... ⓐ ⓑ ⓒ ⓓ ⓔ
24. Reasoning ..... ⓐ ⓑ ⓒ ⓓ ⓔ
25. Study Skills ..... ⓐ ⓑ ⓒ ⓓ ⓔ
26. Ability to combine information from various sources and use it to complete a course project or assignment ..... ⓐ ⓑ ⓒ ⓓ ⓔ

How helpful did you find each of the following services in planning your program of study at this college?

a = not applicable b = not helpful c = somewhat helpful d = helpful e = very helpful

27. Results of the math assessment ..... ⓐ ⓑ ⓒ ⓓ ⓔ
28. Results of a study skills inventory ..... ⓐ ⓑ ⓒ ⓓ ⓔ
29. Results of the English assessment ..... ⓐ ⓑ ⓒ ⓓ ⓔ
30. Results of vocational interest test ..... ⓐ ⓑ ⓒ ⓓ ⓔ
31. Orientation session ..... ⓐ ⓑ ⓒ ⓓ ⓔ
32. Group advising session ..... ⓐ ⓑ ⓒ ⓓ ⓔ
33. An individual appointment with a counselor/advisor ..... ⓐ ⓑ ⓒ ⓓ ⓔ

34. On average, about how many hours per week have you spent studying for this class? ⓐ ⓑ ⓒ ⓓ
    a = 1 b = 2-3 c = 4-5 d = 6 or more

35. About how many hours per week would you need to study in order to earn a grade of "C" or higher? ⓐ ⓑ ⓒ ⓓ
    a = 1 b = 2-3 c = 4-5 d = 6 or more

36. Is there something else that is keeping you from earning a grade of "C" or better in this class (for example, need for financial aid, counseling, child care)? ○ Yes ○ No

If yes, please list

_____

_____

_____

_____

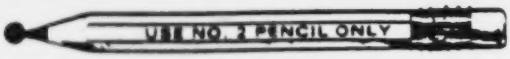
PLEASE DO NOT WRITE OUTSIDE OF THIS BOX.

Only answer the next question if this class is an English writing, reading, or math class and an assessment test was used to place you in this class.

37. In my opinion I:
    ⓐ should have been placed in a lower level course.
    ⓑ belong in this course.
    ⓒ should have been placed in a higher level course.

Printed in U.S.A. NCS Trans-Optic® MP08-75507-321 A2407

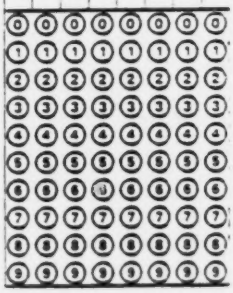
SURVEY OF FACULTY PERCEPTIONS OF SKILLS NEEDED BY STUDENTS TO SUCCEED IN THEIR CLASS

CORRECT MARK 

Dear Instructor:

We would like your opinions about the skills students need to earn a grade of "C" or higher in this class. Please complete this survey and return it along with the survey forms from your students.

CLASS CODE



YOUR NAME.....

COURSE TITLE.....

DAY(S) and TIME CLASS MEETS.....

How important are each of the following skills in succeeding in this class?

a = not applicable b = not important c = somewhat important d = important e = very important

READING SKILLS

1. The ability to understand the textbook, manual or other assigned readings ..... ⓐ ⓑ ⓒ ⓓ ⓔ
2. The ability to summarize the main points in a reading assignment ..... ⓐ ⓑ ⓒ ⓓ ⓔ

WRITING SKILLS

3. The ability to take ideas and present them in a written assignment or report ..... ⓐ ⓑ ⓒ ⓓ ⓔ
4. The ability to write a term paper ..... ⓐ ⓑ ⓒ ⓓ ⓔ
5. The ability to write Standard English sentences with correct sentence structure, verb forms, punctuation, capitalization, possessives, plural forms, word choices and spelling..... ⓐ ⓑ ⓒ ⓓ ⓔ

SPEAKING AND LISTENING SKILLS

6. The ability to communicate ideas clearly in class ..... ⓐ ⓑ ⓒ ⓓ ⓔ
7. The ability to answer and ask questions in class..... ⓐ ⓑ ⓒ ⓓ ⓔ
8. The ability to identify and understand the main points and supporting ideas in lectures and discussions ..... ⓐ ⓑ ⓒ ⓓ ⓔ

MATHEMATICS SKILLS

9. The ability to solve problems using addition, subtraction, multiplication and division..... ⓐ ⓑ ⓒ ⓓ ⓔ
10. The ability to select and use appropriate mathematical approaches in solving problems ..... ⓐ ⓑ ⓒ ⓓ ⓔ

REASONING SKILLS

11. The ability to draw reasonable conclusions from information that is read or heard ..... ⓐ ⓑ ⓒ ⓓ ⓔ
12. The ability to distinguish between fact and opinion..... ⓐ ⓑ ⓒ ⓓ ⓔ
13. The ability to interpret graphs and charts..... ⓐ ⓑ ⓒ ⓓ ⓔ

STUDY SKILLS

14. The ability to take useful notes ..... ⓐ ⓑ ⓒ ⓓ ⓔ

How important are each of the following skills in succeeding in this class?

a = not applicable b = not important c = somewhat important d = important e = very important

THE ABILITY TO PREPARE FOR AND COMPLETE THE FOLLOWING TYPES OF EXAMS:

15. In-class essay exams ..... ⓐ ⓑ ⓒ ⓓ ⓔ
16. Short answer exams ..... ⓐ ⓑ ⓒ ⓓ ⓔ
17. Objective exams (true/false, multiple choice, matching) ..... ⓐ ⓑ ⓒ ⓓ ⓔ
18. Take home essay exams ..... ⓐ ⓑ ⓒ ⓓ ⓔ
19. In-class performance or demonstrations ..... ⓐ ⓑ ⓒ ⓓ ⓔ

For each of the six skill areas listed below, please indicate the percentage of students who entered this course with the skills needed to earn a grade of "C" or higher.

a = not applicable b = 0-25% c = 26-50% d = 51-75% e = 76-100%

20. Reading ..... ⓐ ⓑ ⓒ ⓓ ⓔ
21. Writing ..... ⓐ ⓑ ⓒ ⓓ ⓔ
22. Speaking and Listening ..... ⓐ ⓑ ⓒ ⓓ ⓔ
23. Mathematics ..... ⓐ ⓑ ⓒ ⓓ ⓔ
24. Reasoning Skills ..... ⓐ ⓑ ⓒ ⓓ ⓔ
25. Study Skills ..... ⓐ ⓑ ⓒ ⓓ ⓔ

26. On average, about how many hours per week does a student need to study in order to receive a grade of "C" or higher in this class? ..... ⓐ ⓑ ⓒ ⓓ

a = 1 b = 2-3 c = 4-5 d = 6 or more

27. Are there other factors that contribute to student success in this class? ○ Yes ○ No

If yes, please specify

_____

_____

_____

_____

PLEASE DO NOT WRITE OUTSIDE OF THIS BOX.

28. In your opinion, how many of the students in this class:

	NUMBER		NUMBER		NUMBER
a. should have been placed in a lower level course?	⓪⓪ ①① ②② ③③ ④④ ⑤⑤ ⑥⑥ ⑦⑦ ⑧⑧ ⑨⑨	b. belong in this course?	⓪⓪ ①① ②② ③③ ④④ ⑤⑤ ⑥⑥ ⑦⑦ ⑧⑧ ⑨⑨	c. should have been placed in a higher level course?	⓪⓪ ①① ②② ③③ ④④ ⑤⑤ ⑥⑥ ⑦⑦ ⑧⑧ ⑨⑨

ERIC Clearinghouse for Junior Colleges OCT 20 1989